

*Arney 10-18-4
Serial No. 10/798,064*

Claims Listing

1. (Canceled) ~~An implantable stent comprising:
a tubular member having an interior surface and an exterior surface,
at least one of said surfaces being hydrophobic to a body fluid in that the contact angle
5 between a droplet of said fluid and said at least one surface is greater than 90°, and
a region of said at least one surface including an array of microstructures or
nanostructures that covers first portions of said surface, said array causing said region to have a
dynamically controllable hydrophobicity.~~
- 10 2. (Canceled) ~~The stent of claim 1, further including a control device affixed to said
tubular member for varying said hydrophobicity.~~
- 15 3. (Original) The stent of claim 28, wherein said control device comprises an
electronic device or an optical device.
4. (Original) The stent of claim 3, wherein said control device is remotely actuatable
from an external source.
- 20 5. (Canceled) ~~The stent of claim 1, wherein said array leaves second portions of said
surface exposed, and further including a chemically active substance adhered to at least one of
said exposed second portions.~~
- 25 6. (Canceled) ~~The stent of claim 5, wherein said substance comprises a
pharmacological agent or a drug.~~
7. (Canceled) ~~The stent of claim 6, further including a control device affixed to said
tubular member, said device being capable of releasing said agent or drug from said at least one
second portion.~~

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8. (Currently Amended) An implantable stent comprising:
a tubular member having an interior surface and an exterior surface,
at least one of said surfaces being hydrophobic to a body fluid in that the contact angle
5 between a droplet of said fluid and said at least one surface is greater than 90°, and
a region of said at least one surface including an array of microstructures or
nanostructures that covers first portions of said surface and leaves second portions exposed, said
array causing said region to have a dynamically controllable hydrophobicity. ~~The stent of claim 7,~~
~~further including~~
10 a chemically active substance adhered to at least one of said exposed second portions,
said substance comprising a pharmacological agent or a drug,
an electrically conductive substrate that is configured to be electrically isolated from
body fluid in contact with said array of microstructures or nanostructures, and
a control device affixed to said tubular member for varying said hydrophobicity, wherein
15 said control device is capable of applying a voltage between said array and said substrate to vary
the penetration of the interstices of said array by said fluid, thereby causing release of said agent
or drug into said fluid.

9. (Currently Amended) The stent of claim 8, wherein said array leaves second
20 portions of said surface exposed, and further including
means for electrically isolating said array into laterally separate spatial zones,
at least two of said zones containing chemically active substances adhered to the exposed
second portions thereof, and
wherein said control device is capable of causing the release of said substances of the
25 separate zones at different times.

10. (Original) The stent of claim 9, wherein said substances are the same chemically
active substances of the same or a different dose.

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11. (Original) The stent of claim 9, wherein said substances are different chemically active substances.

5 12. (Currently Amended) The stent of claim ~~18~~, further including means for altering the shape of said stent *in vivo*.

13. (Original) The stent of claim 12, wherein said altering means is capable of changing the diameter of said tubular member.

10 14. (Currently Amended) The stent of claim ~~18~~, wherein said tubular member has an elongated slot that is coextensive with its length, thereby forming a pair of elongated edges that are movable relative to one another, and the stent further comprising a plurality of electrically controllable structures thereon, the structures capable of moving said edges and releasably latching said edges.

15 15. (Currently Amended) The stent of claim ~~18~~, wherein said tubular member comprises a semiconductor substrate and said array of microstructures or nanostructures is disposed on said substrate.

20 16. (Original) The stent of claim 15, wherein said tubular member further comprises a layer disposed on said substrate, said substrate and said layer having different thermal expansion coefficients.

25 17. (Original) The stent of claim 16, wherein said microstructures or nanostructures have at least one dimension that is in the range of 4 μm to 20 nm.

18. (Original) An implantable stent comprising
a tubular member including a conducting substrate, said member having an interior surface and an exterior surface,

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at least one of said surfaces being hydrophobic to a body fluid in that the contact angle between a droplet of said fluid and said at least one surface is greater than 90°, and

a region of said at least one surface including an array of pillar-like microstructures or nanostructures that covers first portions of said surface, said array rendering the region to have a
5 dynamically controllable hydrophobicity between a first state, in which said fluid is suspended over the top of said microstructures or nanostructures, and a second state, in which said fluid penetrates the interstices of said microstructures or nanostructures,

a medicinal substance adhered to an exposed second portion of said surface located in said interstices of said microstructures or nanostructures, and

10 a control device affixed to said tubular member for applying a voltage between said fluid and said substrate to vary said hydrophobicity, thereby releasing said substance into said body fluid when in said second state, said device being actuatable from an *ex vivo* source.

19. (Original) The stent of claim 18, wherein
15 said exposed second portion includes laterally separate first and second spatial zones electrically isolated from one another, each zone containing a medicinal substance adhered thereto, and

said control device is capable of causing the separate release of said substances from the first and second zones.

20 20. (Original) The stent of claim 19, wherein said substances adhered to said first and second zones are the same substance of the same or a different dose.

21. (Original) The stent of claim 19, wherein said substances adhered to said first and
25 second zones are different substances.

22-28. (Canceled)

29. (New) The stent of claims 8 or 18, further including a hydrophobic layer covering

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said array within said region of said at least one surface, said layer being hydrophobic to said body fluid in that the contact angle between a droplet of said fluid and said at least one surface is greater than 90°.

5 30. (New) The stent of claim 29, wherein said hydrophobic layer comprises a polymer.

 31. (New) The stent of claim 30, wherein said hydrophobic layer comprise a material selected from the group consisting of CF_{1.5} and Teflon.

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 32. (New) The stent of claim 29, further including an electrically conductive substrate and an electrically insulative layer disposed between substrate and said hydrophobic layer, said array being formed in said substrate.

15 33. (New) The stent of claim 32, wherein said substrate comprises single crystal silicon and said insulative layer comprises silicon oxide.

 34. (New) An implantable stent comprising
 a tubular member including a conducting substrate, an electrically insulative layer
20 disposed on said substrate, and a hydrophobic layer disposed on said insulative layer,
 said hydrophobic layer being hydrophobic to a body fluid in that the contact angle
 between a droplet of said fluid and a surface of said layer is greater than 90°,
 a region of said substrate including an array of pillar-like microstructures or
 nanostructures, said array rendering the region to have a dynamically controllable
25 hydrophobicity between a first state, in which said body fluid is suspended over the top of said
 microstructures or nanostructures, and a second state, in which said fluid penetrates the
 interstices of said microstructures or nanostructures,
 a medicinal substance disposed within said interstices of said microstructures or
 nanostructures, and

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a control device affixed to said tubular member for applying a voltage between said fluid and said substrate to vary said hydrophobicity, thereby releasing said substance into said body fluid when in said second state, said device being actuatable from an *ex vivo* source.